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Mössbauer forward scattering: time-domain spectra

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Abstract

© 2016, Springer International Publishing Switzerland.The transmission of the Mössbauer radiation through an absorber being in the acoustic oscillation mode under forward scattering (FS) conditions has been analyzed. The modification of the existing models of the FS spectra (frequency and time) formation to the case of the arbitrary phase correlation of nuclear oscillations in the sample has been proposed. An adequate description of the time delayed experiments with the 57Fe Mössbauer resonance using the modulation of the single-photon wave packet by acoustic field has been obtained. One has been done in the frame of the Raman scattering of Mössbauer photons. The models extended this way can be used to control the degree of phase correlation of nuclear oscillations (or other processes) induced in the sample by external fields.

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Keywords

Effect of acoustic oscillations, Mössbauer scattering, Single photon response, Time spectra